

The Animated Sequence 5.

animating a single interaction sequence of registered images

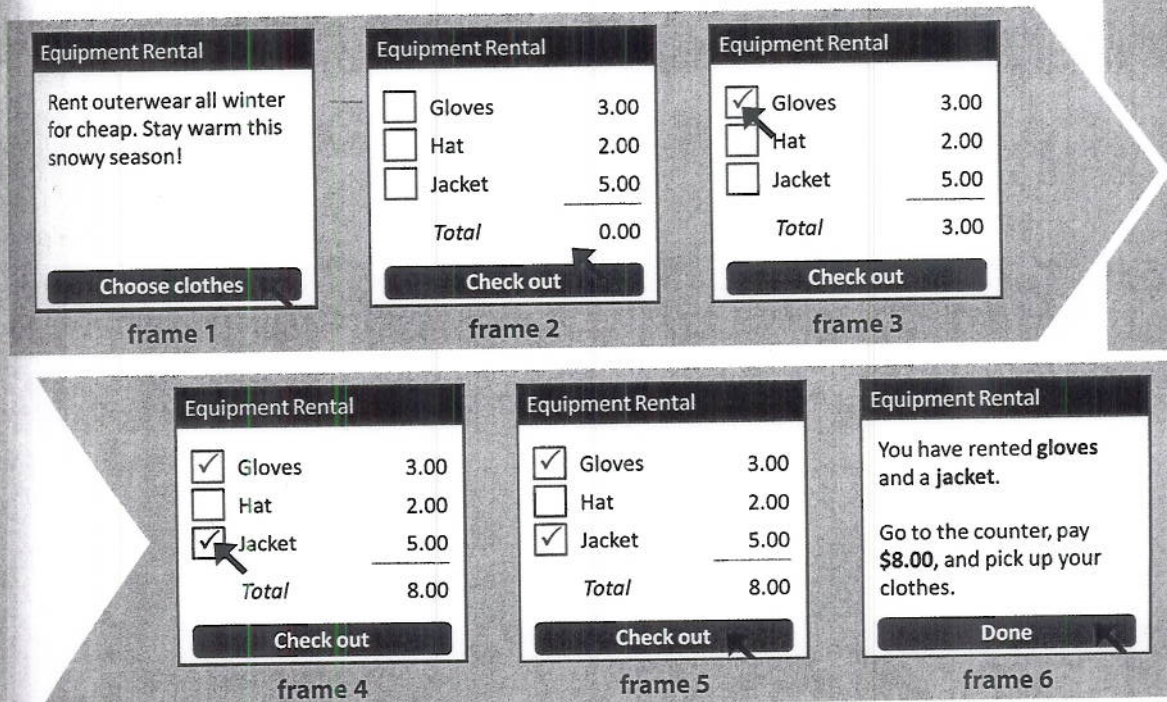
The last section showed how an interaction sequence can unfold by showing successive frames as a storyboard. In essence, *time* unfolds over *space*. Another approach is to *animate* the sequence, where the story unfolds by displaying successive frames in the same location over time. That is, the animated sequence becomes a movie.

THE SLIDE SHOW

Chapter 3.6 described how presentation tools such as PowerPoint can simplify the task of creating individual sketches. Presentation tools are also very suitable for creating an **animated sequence**. The idea is simple: you create your storyboard as a sequence of successive PowerPoint frames. Then you go into slideshow mode to animate the sequence. But to make this work, you first need to know about the **registration problem**, and how to solve it by **registering images**.

THE REGISTRATION PROBLEM

Imagine the simple interface below (an equipment rental system), shown as a storyboard illustrating a person's interaction while renting a pair of gloves and a jacket.



Materials

Slideware or equivalent presentation software

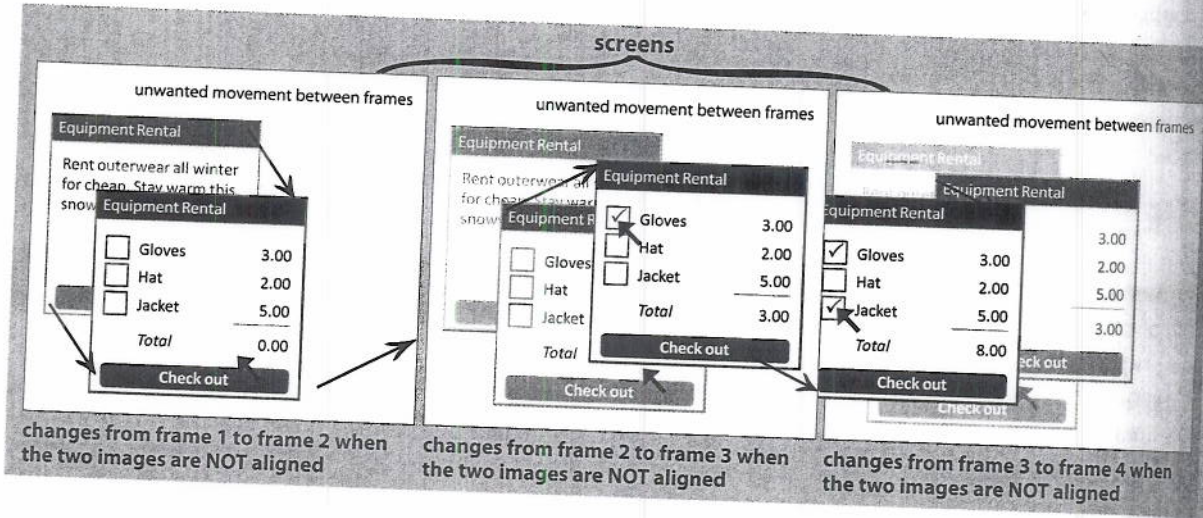
For example,

– Microsoft PowerPoint

– Apple Keynote

You want to animate this scene by using these images as frames. Each frame will be a slide in a slide deck in your presentation tool. We animate them by playing the slide deck as a slide show.

But what would happen if each image was in a slightly different position on each slide? The images would jump around, and the illusion of animation would be broken. For example, if we take the first four frames and simply place them atop each other without paying attention to aligning them, we may get something similar to what is shown below. This clearly won't work, as the viewer doesn't expect the static elements in the image – the window frame, its title, the position of unchanging content – to jump around between frames.



THE SOLUTION: REGISTERING IMAGES

The easiest way to solve the registration problem is to create a series of templates, where static items are always in the same fixed position on the slide (templates were introduced in Chapter 3.8). You would then modify these templates to create your actual frames. As long as you don't move the fixed items around, your static items will then appear in the same place in your animated sequence.

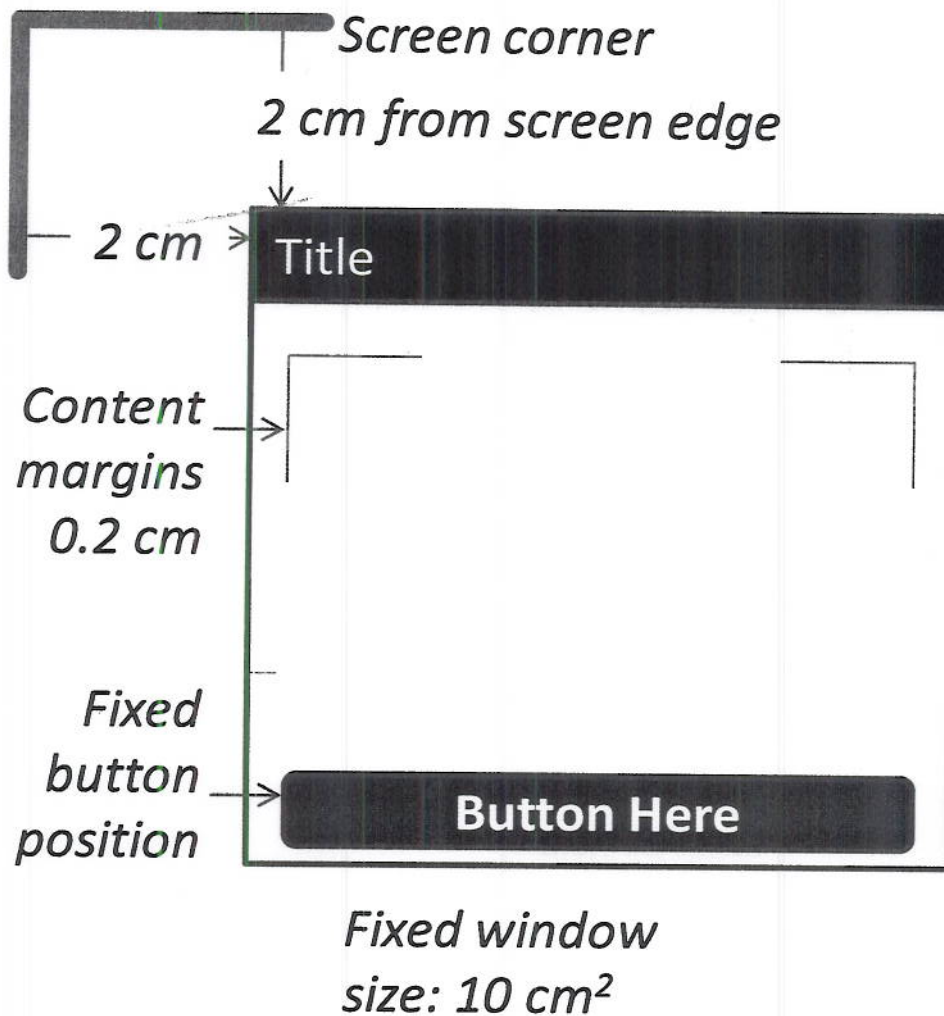
- 1 Create a Master Frame Template**
 Create a master template that contains only those elements that are constant in each frame – the lowest common denominator of graphical items across frames. This will help you create other templates.

In our well-known animation, the position of the application window appears to jump around between frames.

Finally, these key points...

In our example interface, this will comprise the window itself, its title bar and title text, as well as the button and its text. We also specified some key positions of some items relative to another. First, we marked the upper left corner of the frame (or screen) edge, and specified the position of the window relative to that corner. This ensures that the window will always appear in the same spot on the frame. Second, we marked the window content margins at the left and right part of the window, because we always want the window contents to appear within this fixed margin.

Finally, because we will make copies of this template, we can expect the sizes and positions of all these elements will stay in the same place. Just in case, we've annotated the template with several key positions and sizes.

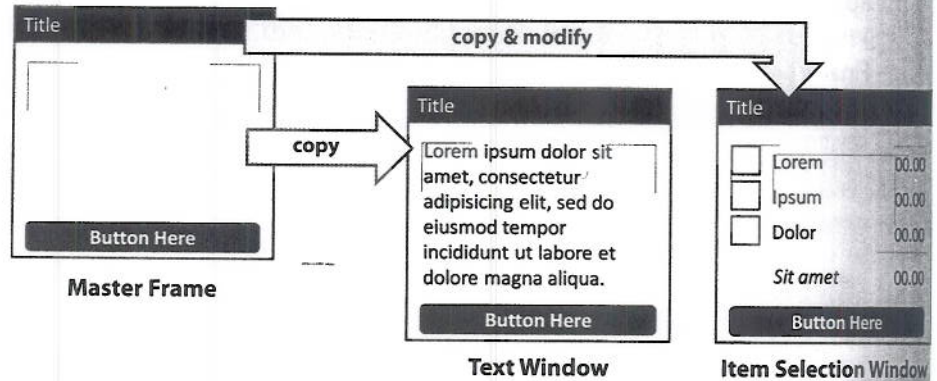


Tips

The beauty of using presentation software is that we can insert editable placeholders in the template, where the position of the placeholder content will remain unchanged even after we edit it. In our master template, for example, the left-adjusted title bar text and the centered button text will always be in the right position, even after we edit its text. Similarly, we can edit the text in the other more specialized templates, such as the information text on our text window and the items (and amounts) in our item selection window. The trick is to anticipate what our editable content will be, and to create and position our items accordingly so they can be edited in future frames.

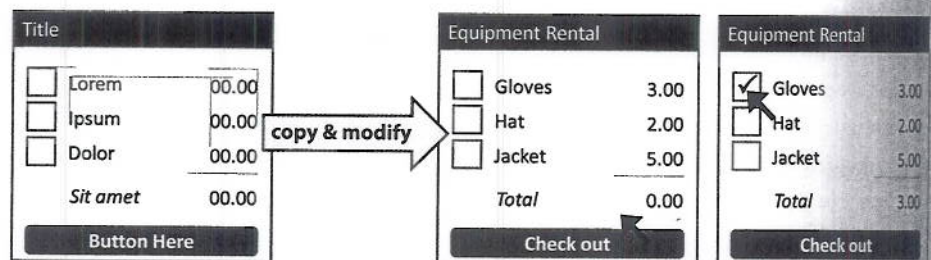
2 Create Specialized Frame Templates

You can now refine the master template to make more specialized frame templates. Within a presentation tool such as PowerPoint, all you have to do is copy the slide holding the master frame template, and then edit that copy accordingly.



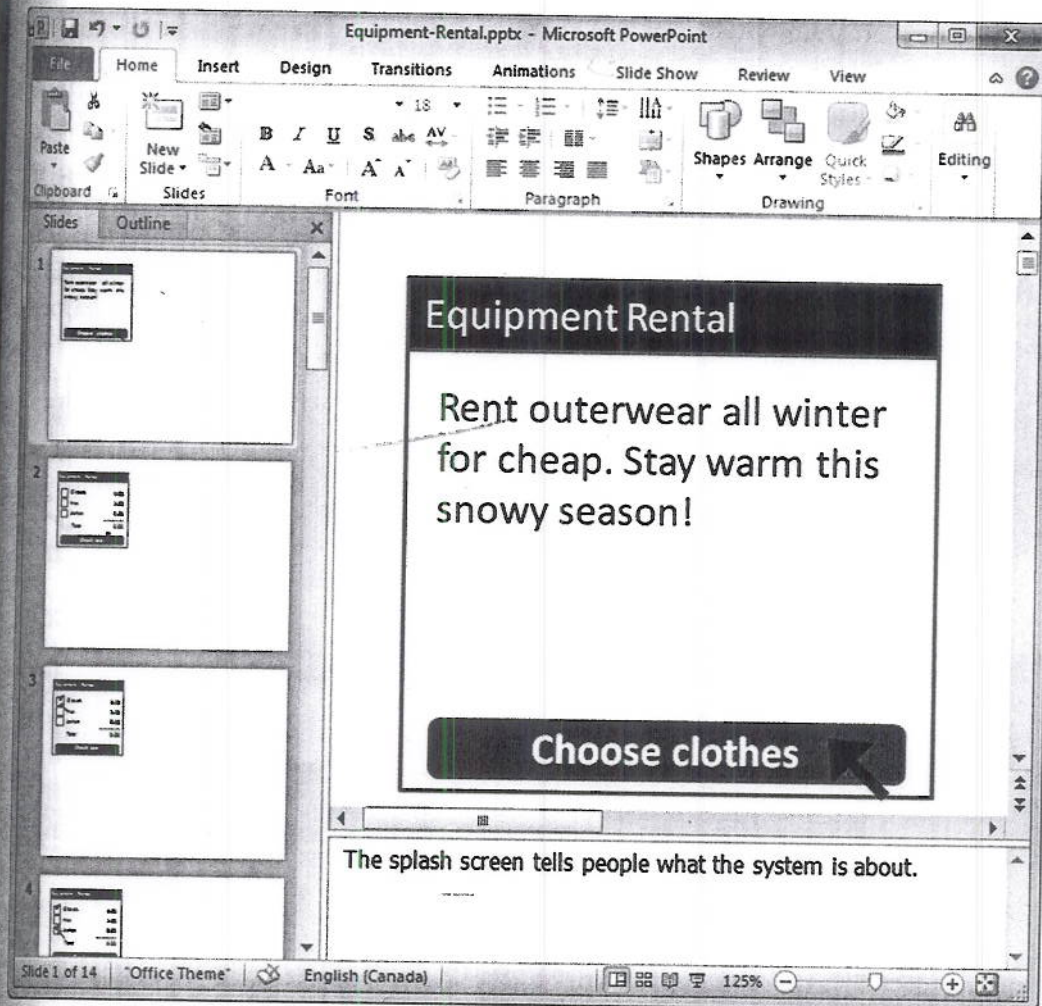
3 Create Final Frames

Finally, you can then copy and modify the template to create your final frames. For example, here are two frames created from the template for item selections. To compose these frames, you would just edit the existing text, and add and move a 'cursor' to indicate what the user has selected. The key is that all elements in the graphics are in the correct position across all frames, i.e., they are registered.



4 Place Each Frame in the Desired Sequence in Your Presentation Software

Because each frame is just a copy of a template, and because items are in constant locations, all you need to do now is place the frames in the order you want them played out as a sequence. This should be the same as your storyboard. For example, this is what the sequence looks like in PowerPoint. The left bar shows each frame in the sequence.



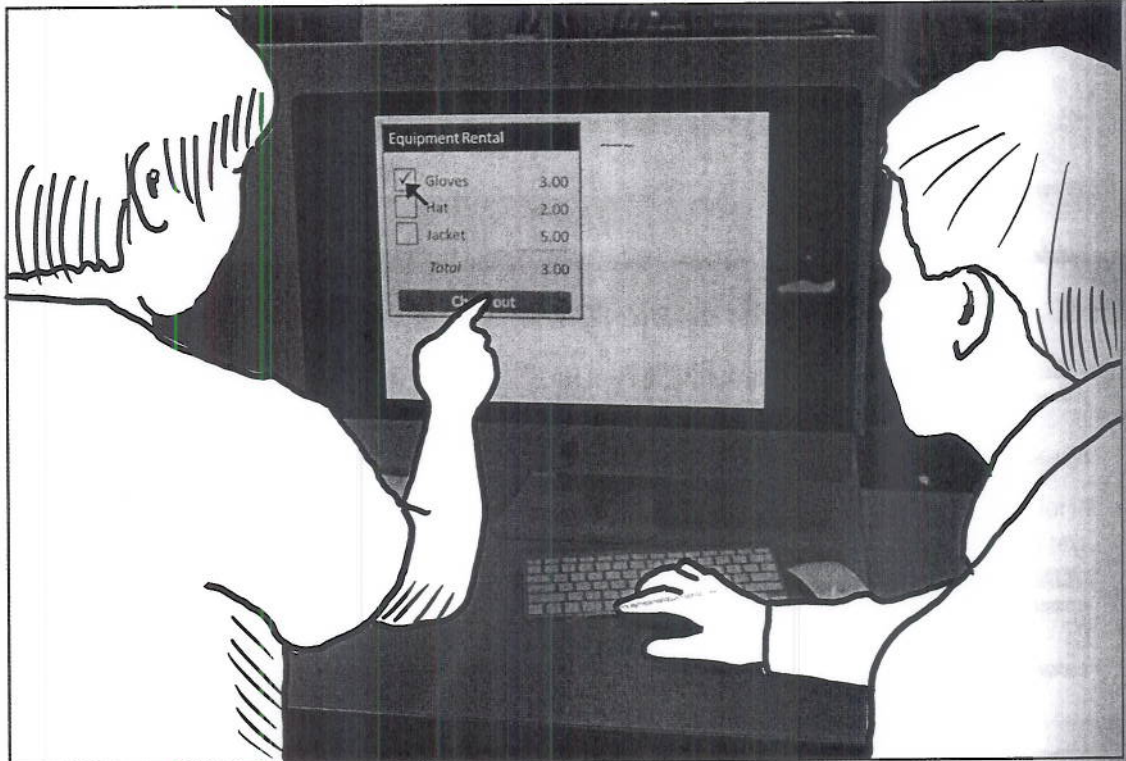
Tips

You can use the 'speaking notes' facility in a presentation tool to annotate your frames. For example, the bottom region in the figure explains what this particular frame is for.

While we illustrate our example using slideware, registering images can be used for other forms of media. Chapter 5.5 illustrates how the same technique can apply in video production.

5 Playing the Sequence

Most presentation tools will let you just show your sequence as a series of slides. You can advance between slides either manually (e.g., by pressing the space bar) or automatically (e.g., by specifying a time between slides). The former is an effective way to show and explain your sequence to others, while the latter could be a means to let others see your sequence when you are not around (but you may want to annotate each frame to explain what is going on if there is any ambiguity). In either mode, you will notice that the animation is not fluid, mostly because the cursor jumps from one position to another. We will fix this in the next chapter.



YOU NOW KNOW

Animating a storyboard is a simple matter of displaying each frame, one after another, at the same location. Image registration makes this effective, where the static elements across frames are displayed in exactly the same place. If your graphics jump around, it will break the illusion of continuity. You can create templates to help you register images, where your frames are just modified copies of each template. Because the static elements are in the same position, the elements will not jump around as you switch from one frame to another in your sequence.

Motion Paths 5.2

smoothly animating movement emphasizes the feeling of interaction

<input type="checkbox"/>	Gloves	3.00
<input type="checkbox"/>	Hat	2.00
<input type="checkbox"/>	Jacket	5.00
<hr/>		
	Total	0.00

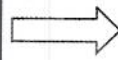
Check out

In Chapter 5.1, you probably noticed that the cursor, which was embedded in each frame, jumps from one position to another as the frames are played as a slide show. This breaks the viewers' feeling that they are 'watching' someone interact with the system. We will fix this by animating the cursor in each frame using the **motion paths** facility found in most slideware presentation software (such as Microsoft PowerPoint) or animation systems (such as Adobe Flash). Apple's Keynote calls these **move actions**. As our example, let's look at just frames 2 and 3 from the equipment rental sequence introduced in Chapter 5.1. Our goal is to animate the cursor so it moves smoothly from its position in Frame 2 to its position in Frame 3.

Equipment Rental		
<input type="checkbox"/>	Gloves	3.00
<input type="checkbox"/>	Hat	2.00
<input type="checkbox"/>	Jacket	5.00
<hr/>		
	Total	0.00

Check out

frame 2



Equipment Rental		
<input checked="" type="checkbox"/>	Gloves	3.00
<input type="checkbox"/>	Hat	2.00
<input type="checkbox"/>	Jacket	5.00
<hr/>		
	Total	3.00

Check out

frame 3

1 Getting Ready

We will use PowerPoint; if you use different software, it will likely have a similar animation capability although perhaps under a different name. In my version of PowerPoint, I access motion paths from the animations tab. I'll also reveal the animations pane, which will let me play the animation. All my animations will happen in the first frame above, where my goal is to move the cursor from its position above the 'Check out' button to its new position above the 'Gloves' checkbox.

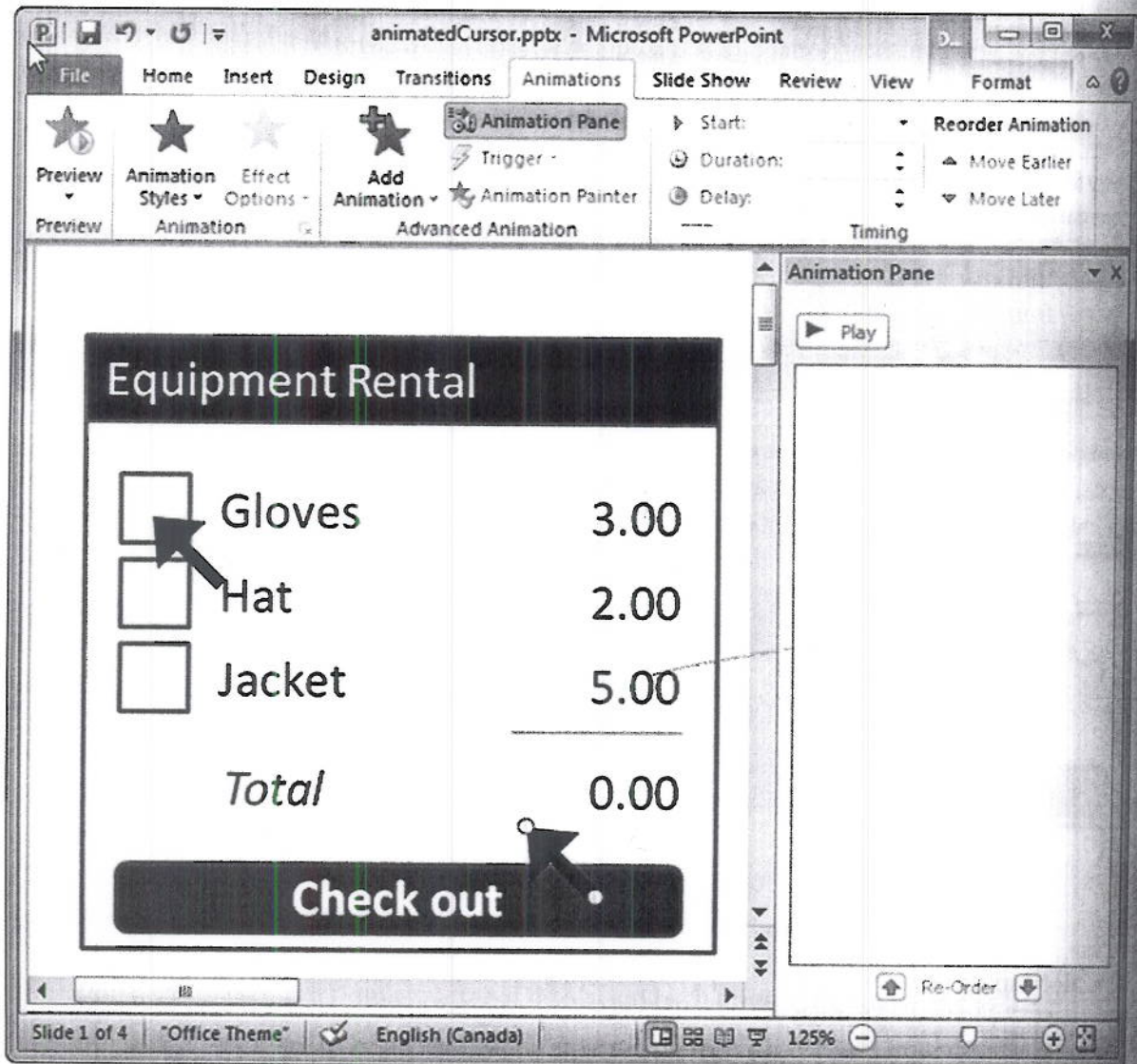
Materials

Slideware or equivalent presentation and animation software with motion path capabilities

For example,

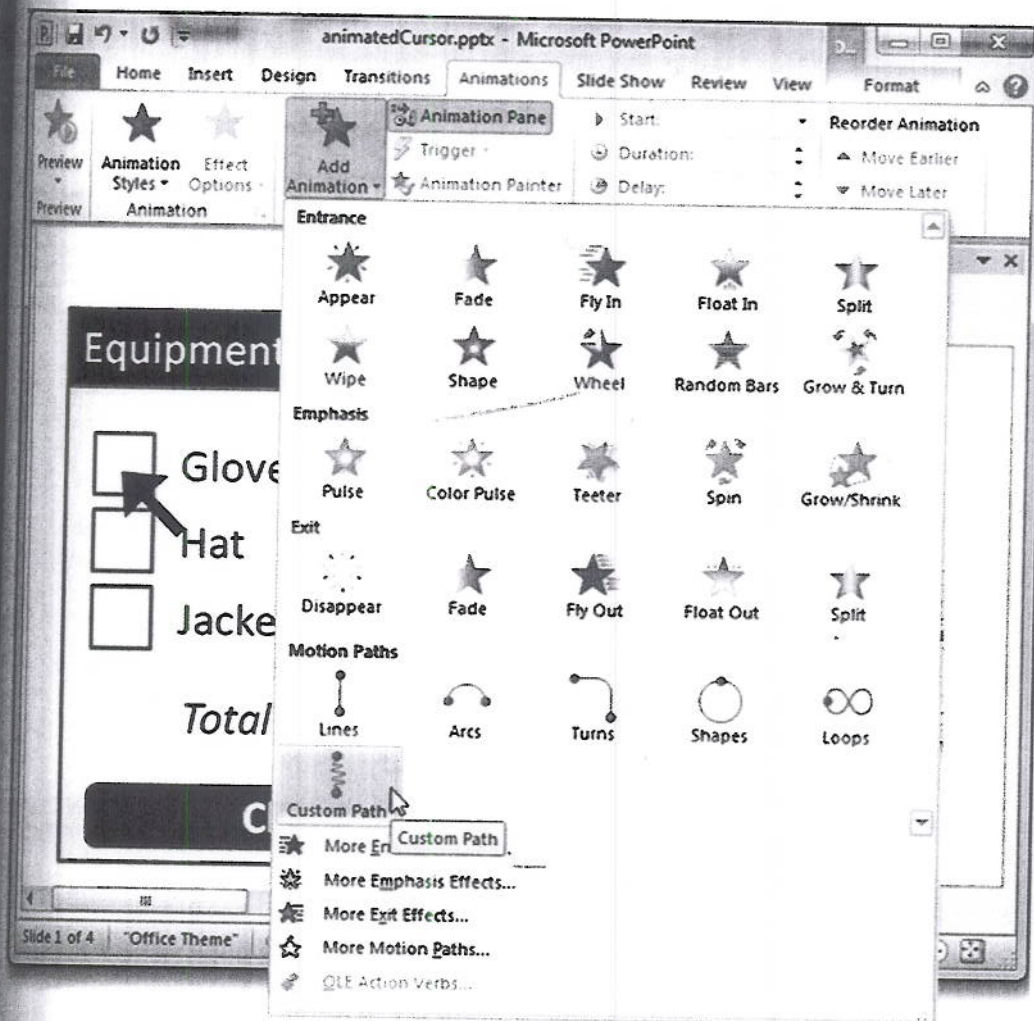
- Microsoft PowerPoint
- Apple Keynote
- Adobe Flash

Because I need to know the final position of the cursor, I'll copy and paste the cursor from Frame 3 to Frame 2 (I will delete this later – it's just for reference). I'll now select the original cursor, as that is what I want to animate. My window now looks something like this. Note that the cursor is selected.



2 Selecting a Motion Path

Because a graphical object (the cursor) is selected, the **Add Animation** button is active. When I select that, a drop-down menu appears that shows all the ways I can animate that graphic. Motion paths are at the bottom, where I can choose several pre-formatted motion paths (e.g., straight line, and arc, a turn). I can also specify the motion path manually by the 'Custom Path' option, which is what I will do here.



Tips

Explore Your Animation Tools

Animation facilities in modern slide presentation and animation tools are very powerful. If you have a tool that you use regularly, it is definitely worth your while to explore its animation facilities. You can add effects such as transitions between frames, compound animations (e.g., by stacking one animation after another), complex sound effects, and so on.

While we will revisit a few other animation methods in Chapter 5.4, it's beyond the scope of this book to get into them in detail.

Tips

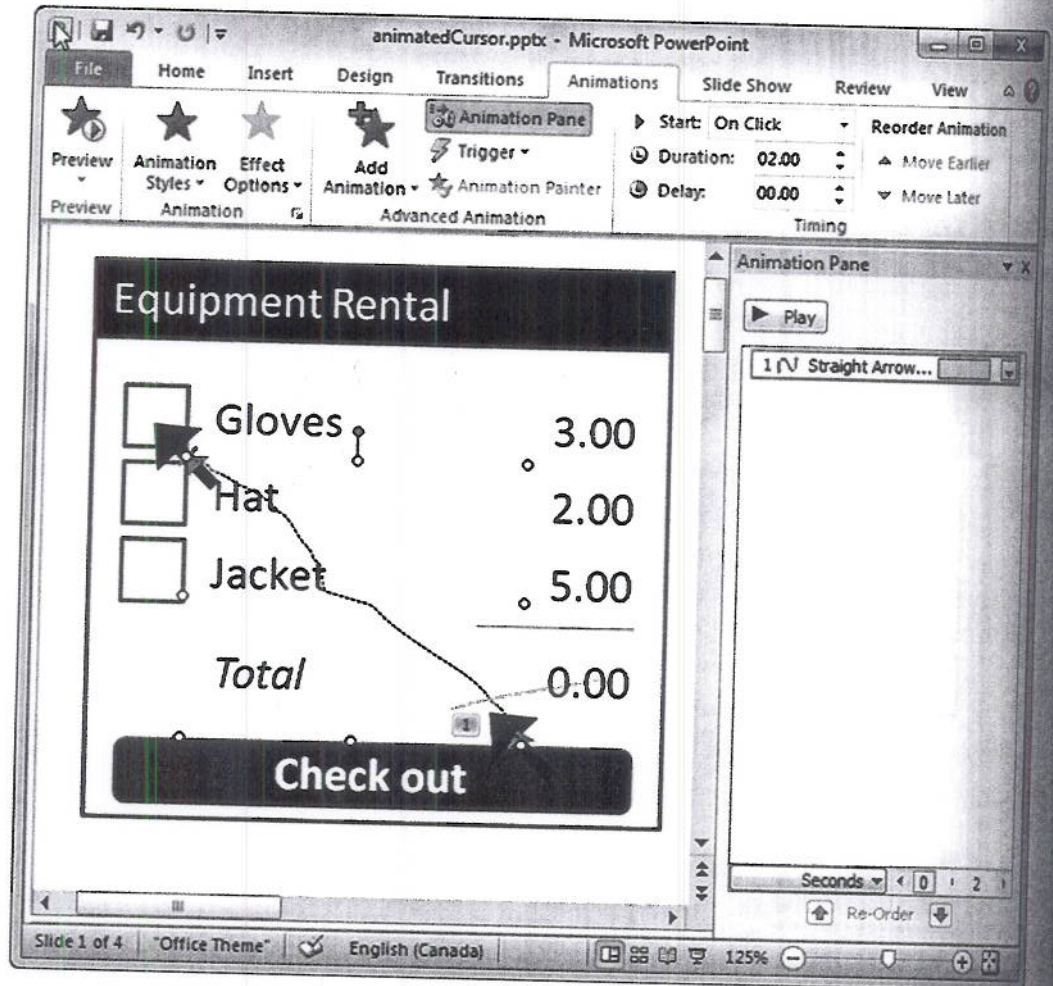
Other Animation Tools

Presentation tools are primarily for creating slide shows; animations were added to them as another way to craft compelling presentations. While simple animations can be added to your sequence, complex ones tend to be either impossible because the tool doesn't support them, or hard to do.

If you regularly design scripted slide shows (see Chapter 6.4), or if you are interested in complex animations, you should learn an animation tool specifically designed to animate graphics, such as Adobe's Flash. While the learning curve is higher than a presentation tool, such applications provide far more creative power (we show a few in Chapter 5.4). The danger is that you will spend your time creating lovely animations rather than developing your ideas. Remember the role of your sketch!

3 Creating the Motion Path

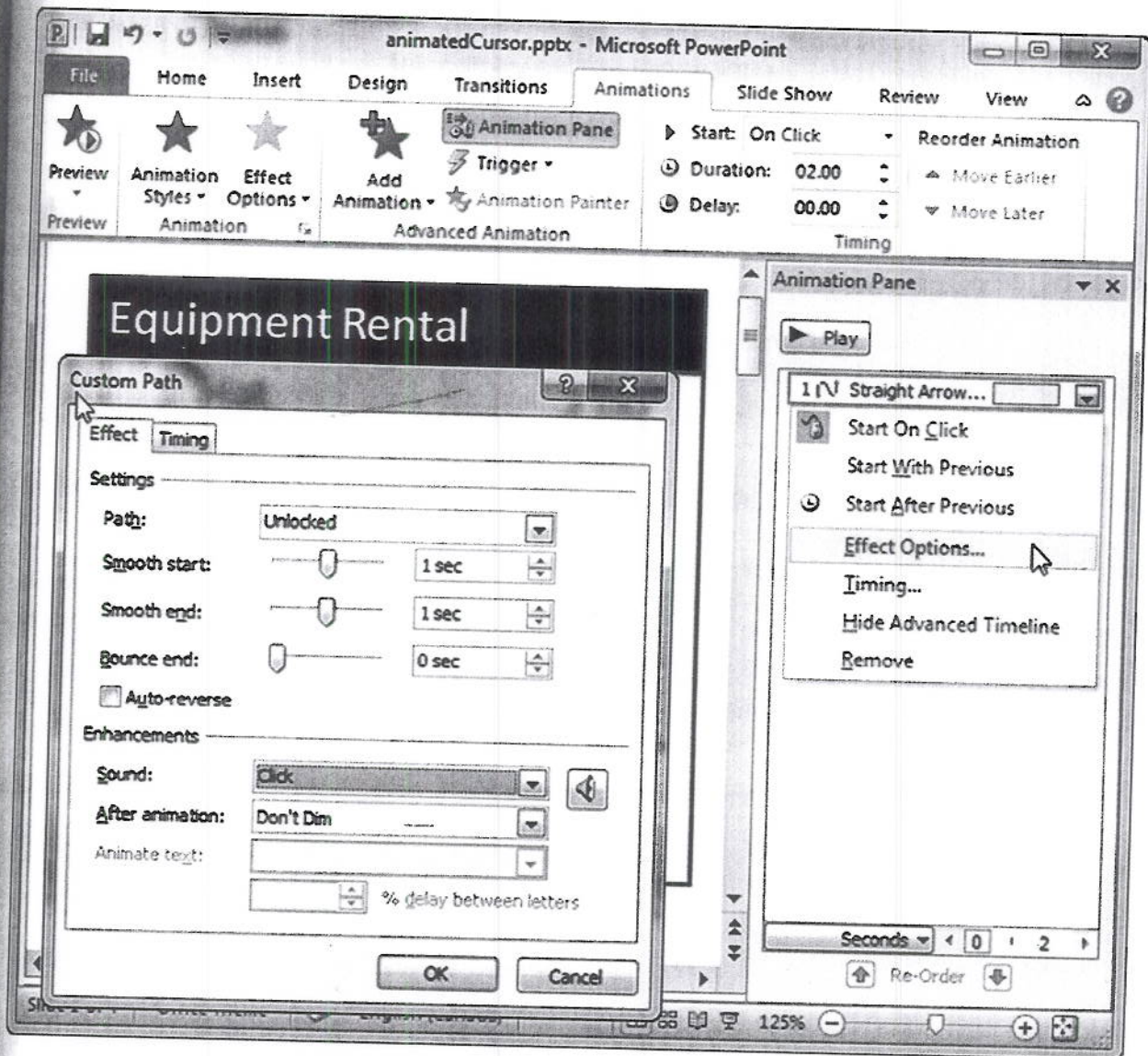
The next step is to draw a line that indicates the actual path of movement of the cursor. You do this simply by drawing a line from the center of the cursor to the center of the other cursor. After this is done (and checking to make sure the animation works), you can remove the reference cursor you had pasted in.



4 Adding Effects

At this point (and depending on your software), you can further control the animation. In PowerPoint, I can select the animation in the animation pane (on the right side) and raise a menu and control panel window that gives me this control. For example, I can control when the animation starts, and how slowly or quickly the animation plays (via its timing).

I can also add a variety of effects to the animation. In this case, I added a clicking sound to this animation, to emulate the user clicking the 'Gloves' checkbox.



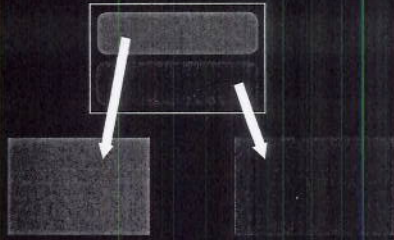
YOU NOW KNOW

Motion paths let you animate graphical items, such as a cursor, as you switch between frames. When used effectively, it increases the viewers' feeling that they are watching a movie of someone interacting with your system.

Branching Animations

5.3

animating different interaction paths
in a branching sequence



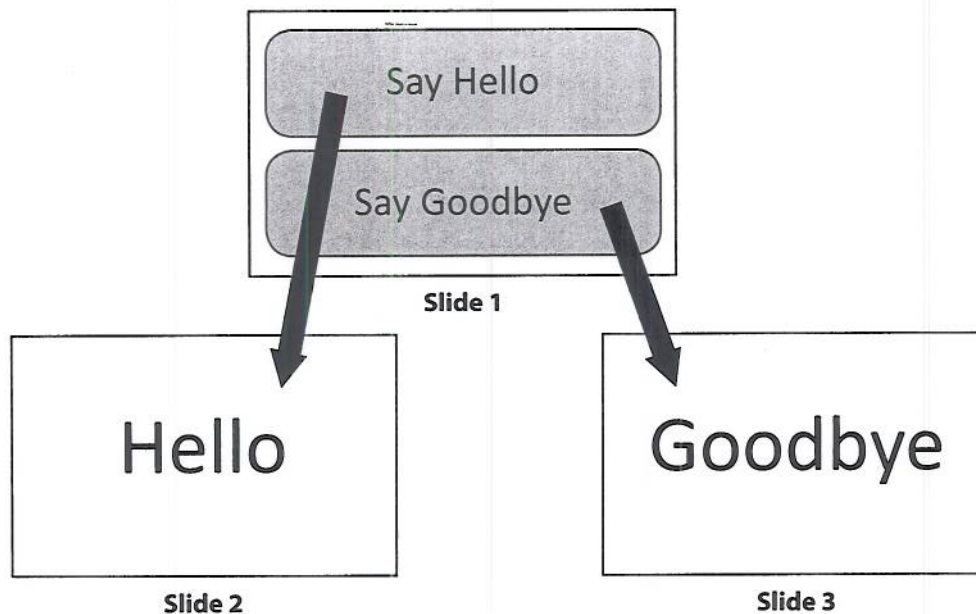
Chapter 4.3 illustrated how storyboards can have multiple branches (or interaction paths), where the particular path taken at a branch point usually depends on the particular action of an end user. This chapter explains how – unlike a normal movie or slide show – you can create sketch animations that allow different paths to be taken as the animation runs.

SELECTING ALTERNATIVE INTERACTION PATHS THROUGH HYPERLINKS

Many slide presentation systems allow you to embed a **hyperlink** into or atop of particular graphics or regions of a *slide*. While the hyperlink can point to many things, for our purposes we will use a hyperlink that references another slide in the current slide deck.

The best way to illustrate this is to try it yourself. Our first example, illustrated below, will be a trivial sketch across three slides, with each slide representing a different system state. Slide 1 contains two 'buttons'. Depending on which button you click, different text will then be displayed. As suggested by the arrows below, clicking 'Say Hello' will display slide 2, while clicking 'Say Goodbye' will display slide 3.

- 1 Create the three slides below (I used PowerPoint). The first slide is just two rectangles with some text in them, while the other two just contain the given text.



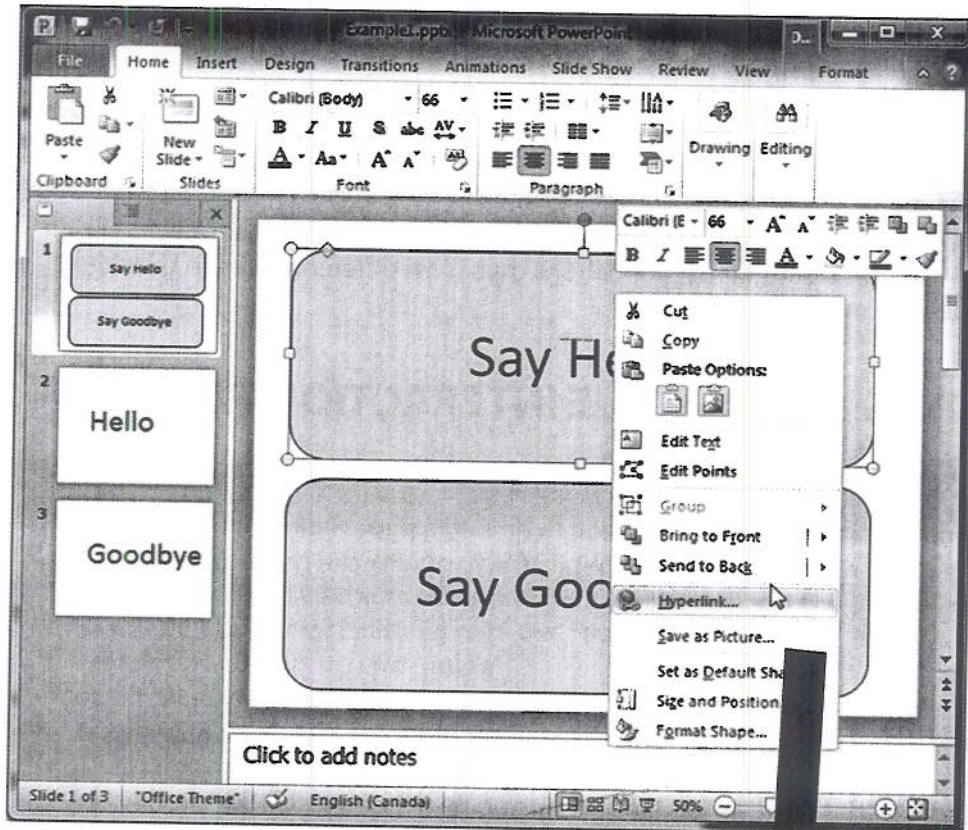
Materials

Slide presentation software that lets you:

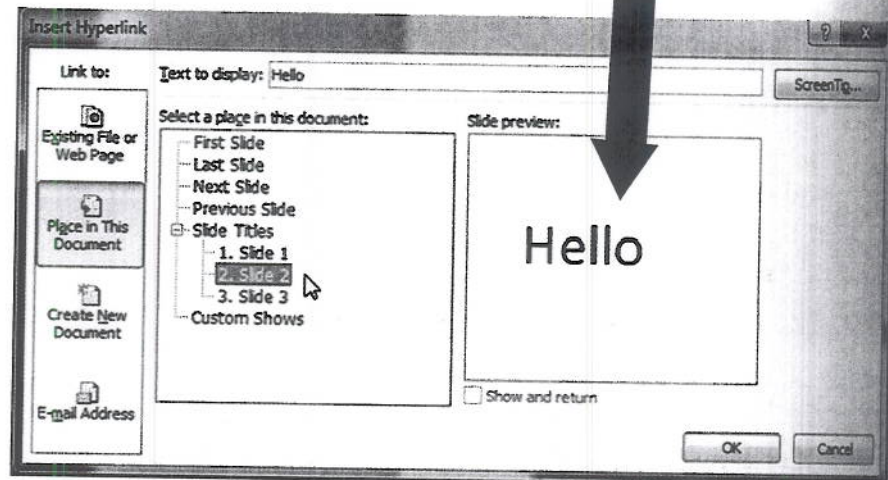
- hyperlink from an area or object on one slide to another slide

Microsoft PowerPoint is an example of such a system, but there are many others available that you can use.

- 2** Add a hyperlink to the 'Say Hello' rectangle, which links to slide 2. In my version of PowerPoint, you do this by right-clicking over the 'Say Hello' rectangle to raise the context menu, and then select the 'Hyperlink' option.



- 3** This raises the dialog box below showing the kinds of things you can link to (see left side). Select the 'Place in this Document' button, and then select slide 2 containing the text 'Hello'.



- 4** Similarly, add a hyperlink to the 'Say Goodbye' rectangle, except this time make the hyperlink point to slide 3.

- 5** Play your slide show; clicking each button should jump to the appropriate slide.

Tip

Animating indexed state transition diagrams

Hyperlinks can also link to other slide decks. This means you can put sub-sequences into individual slide decks. Your 'master' slide deck can then index these sequences. This helps manage complexity. It also means you can develop alternative sub-sequences that can be accessed simply by changing the hyperlink.

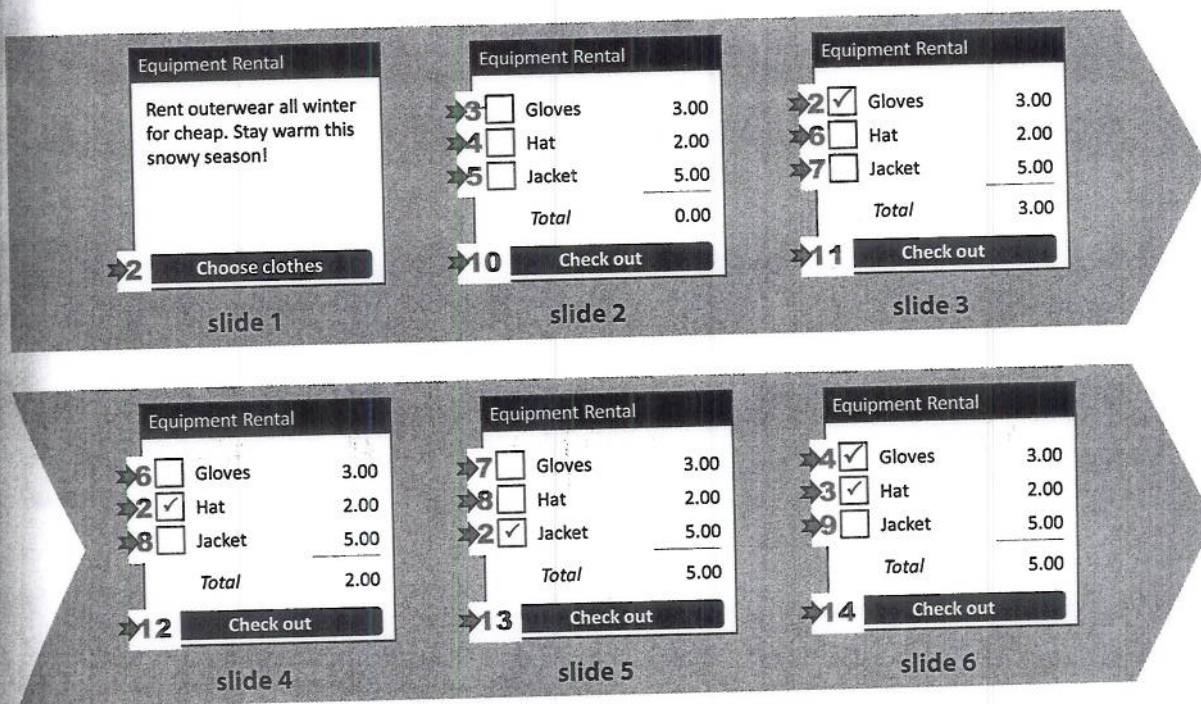
Example: A Complete Branching Animation

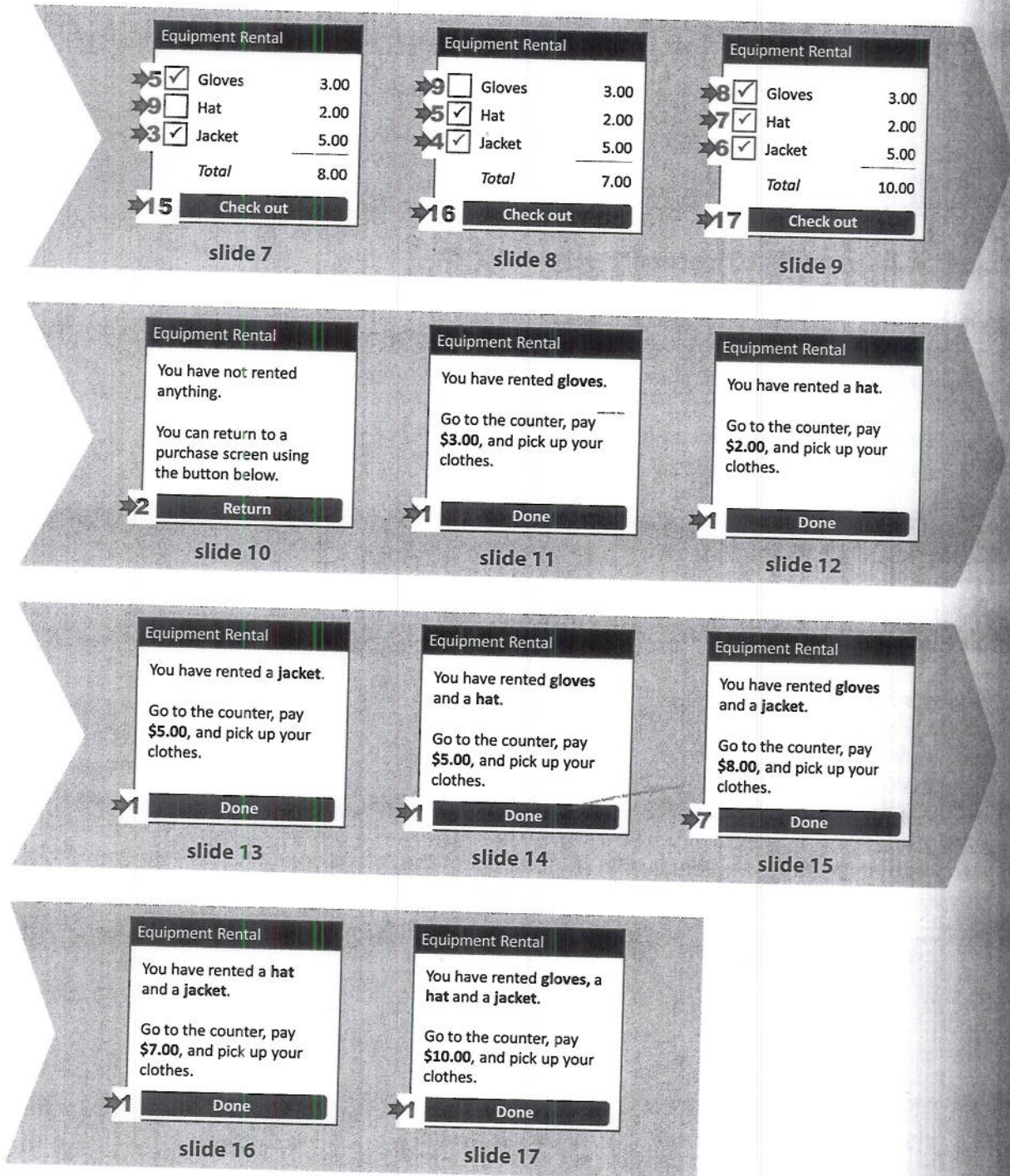
Reconsider our example equipment rental system you saw in Chapter 5.1. There are three types of screens: the initial splash screen, the rental screen, and the final payment screen. Try (on your own) to create a branching animation that illustrates the results of all possible interactions. In essence, you are creating a fully detailed state transition diagram, showing the effects of all user operations. Make sure to include what happens when you click on all buttons and checkboxes. Also include unclicking boxes that you may have checked previously (i.e., an 'undo' operation).

Hint: Create versions of all screen possibilities, order them in your slide deck, and then add the necessary hyperlinks.

Solution

The screens below realize all possibilities as a branching animation. The numbered arrows next to each interactive element (the buttons and checkboxes) indicate the hyperlink, i.e., it shows what screen would be displayed if a person clicked in that interactive element. For example, in slide 2, clicking the 'Gloves' checkbox would go to slide 3. However, clicking the 'Hat' checkbox in slide 2 would go to slide 4 instead. Undo also happens. In slide 3, clicking the 'Gloves' checkbox goes back to Slide 2; that is, it is the same as unchecking the box. In slides 2 through 9, clicking 'Checkout' leads to a variety of different slides, as the text content of the screen depends on what items had been selected. In Slides 11–17, clicking the 'Done' button always return to the initial slide 1.





The advantage of having a fully operational branching sequence is that you or someone else can operate the interface as if it were real. No direction is needed, as all options work. Another advantage is that it forces you to consider all possible paths in your system. But see the tip: this is a double-edged sword.

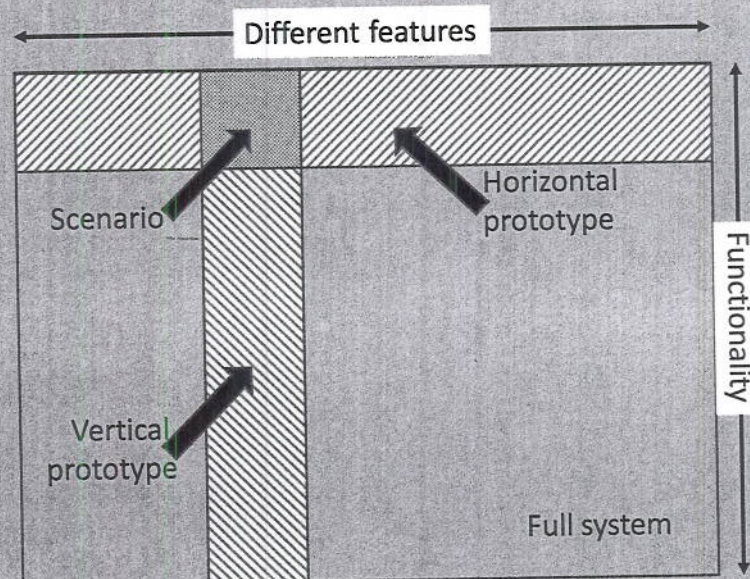
Tips

Are You Feeling Overwhelmed?

Our simple example required you to create the 17 different screens, and to add 33 hyperlinks. This is clearly tedious, even with templates. It is also impractical if you are sketching a system that is feature-rich.

The solution to this is to only instrument a few key paths, i.e., enough to illustrate your idea. Remember, this is a sketch, and a sketch is about ideas. For example, you may want to show how one goes from the splash screen (slide 1), to the main order screen (slide 2), and how one can select and unselect one or two items (e.g., slide 3 and slide 7), and an example of how one can place the order (slide 15) or what happens when no items are selected (slide 10). All other paths are so similar that little benefit is gained from 'implementing' them in the animation.

The basic strategy is to animate just enough of your sketch paths to illustrate the breadth of different features in your system, while going into just enough depth to illustrate the functionality of those features. Jacob Nielsen calls this **Horizontal** (breadth) vs. **Vertical** (depth) **prototyping**. (He also describes a **Scenario**, which is a single scripted path through your sketch – this is equivalent to a sequential animation.) Your selection of animation paths don't even have to do both – your sketch animation may only explore the functionality of a single feature in depth, but not other features. Or you may want to give an overall 'look and feel' of your system by showing the different features, without going into depth about the actual functionality of any one of them.



Horizontal vs. Vertical prototyping. Redrawn from Nielsen.

References

Nielsen, J. (1993) *Usability Engineering*. Morgan-Kaufmann. See the chapter on The Usability Engineering Lifecycle, pp. 94–95.

YOU NOW KNOW

Branching animations can be implemented easily using hyperlinks in slide presentation systems, where the branch taken depends on the hyperlink selected. You can use these animations to illustrate different high level portions of your system (horizontal prototyping) or to go into depth of a portion of your system (vertical prototyping), or a combination of the two.